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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/759,008	01/20/2004	Ryogo Kawai	118384	6829
25944	7590	04/15/2005	EXAMINER	
OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320			ADDISU, SARA	
			ART UNIT	PAPER NUMBER
			3722	

DATE MAILED: 04/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/759,008	<b>Applicant(s)</b> KAWAI ET AL.	
	<b>Examiner</b> Sara Addisu	<b>Art Unit</b> 3722	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 January 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6, 8 and 9 is/are rejected.
- 7) ☒ Claim(s) 7 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>1/20/04</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1- 3, 5, 6, 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Flynn (U.S. Patent No. 6,435,780) in view of Kuberski (U.S. Patent No. 5,779,399) and further in view of Deller (U.S. Patent No. 4,560,308).

Flynn teaches carbide end mill having a cylindrical body with plurality of flutes (26 and 28) defining plurality of peripheral cutting edges [first (32) and second (34) respectively] and corresponding plurality of end cutting edges [first (20) and second (22)] (see figures 1 and 2). Flynn also teaches cutting tool having two or more flutes (therefore even number (e.g. four) of flutes with even number of peripheral and end cutting edges).

Flynn discloses the claimed invention except for the use of cemented carbide to make the end mill. It would have obvious to one having ordinary skill in the art at the time the invention was made to utilize carbide to make an end mill as taught by Flynn since the Examiner takes Official Notice of the equivalence of cemented carbide (as claimed in claims 3 of the instant application) and carbide for their use making cutting tools like insert/cutters, drills and end mills, wear parts and dies and the selection of any

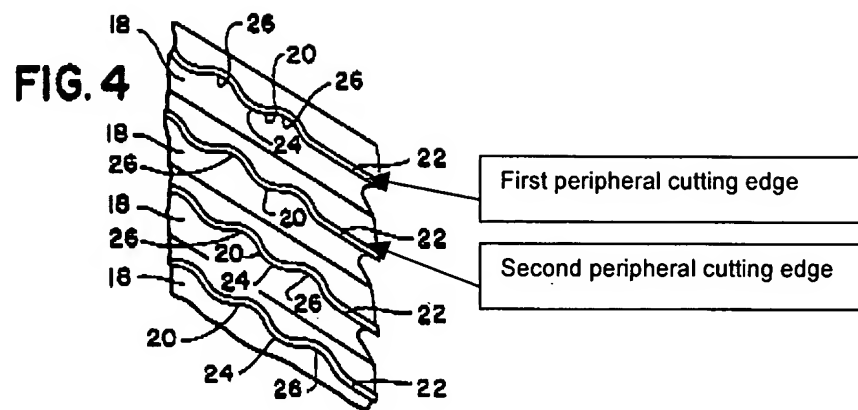
Art Unit: 3722

of these known equivalents to harden a cutting tool would be within the level of ordinary skill in the art.

However, Flynn fails to teach the first axial rake angle of the first end cutting edge being smaller than the second axial rake angle of the second end cutting edge. Flynn also fails to teach first radial rake angle of the first peripheral cutting edge being larger than the second radial rake angle of the second peripheral cutting edge.

Kuberski teaches an end mill having plurality of flutes (14 & 16) having a constant core diameter (42) (see figure 3 and Col. 2, lines 35-36). Kuberski also teaches first axial rake angle (angle front face (30) makes with longitudinal axis) being less than second axial rake angle ('399, Col. 2, lines 18-26 and figures 1 & 2).

Deller teaches a rotary cutting tool having a cylindrical body, plurality of flutes (18) and peripheral cutting edges (i.e. first and second cutting edges) (20) (see diagram below). Deller also teaches continuous cutting edges (20) with generally sinusoidal shape having radial rake angle that varies between positive and negative along the edge. ('308, Col. 2, lines 53-58 & Col. 3, lines 21-26). Furthermore, Deller teaches the positive rake portion (valley) (i.e. first radial rake angle) of the first peripheral cutting edge being larger than the negative rake portion (peak) (i.e. second radial rake angle) of the second peripheral cutting edge ('308, Col. 3, lines 29-32).



Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify Flynn's invention, such that the first axial rake angle of the first end cutting edge is smaller than the second axial rake angle of the second end cutting edge as taught by Kuberski such that the first axial rake provides the necessary cutting edge and flute strength to ramp cut or circular interpolate into hard material while second axial rake reduces chip packing by pushing metal chips up and out from the flute ('399, Col. 2, lines 28-32). It would have also been obvious to one of ordinary skill in the art at the time of the invention was made to modify Flynn's invention, such that the first radial rake angle of the first peripheral cutting edge is larger than the second radial rake angle of the second peripheral cutting edge as taught by Deller for the purpose of achieving superior chip breaking characteristics and work piece surface finish ('308, Col. 1; lines (56-62), Col. 2, lines (61-64) and Col. 3, lines (5-7).

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Flynn (U.S. Patent No. 6,435,780) in view of Kuberski (U.S. Patent No. 5,779,399) and Deller (U.S. Patent No. 4,560,308), and further in view of Hougen (U.S. Patent No. 5,094,573).

Flynn, Kuberski and Deller teach an end mill having a cylindrical body, plurality of flutes with peripheral cutting edges and end cutting edges as set forth in the above rejection. Furthermore, Deller teaches positive radial rake angle having positive portion up to 25 degrees ('308, Col. 3, lines 44-45). This range meets the limitation claimed in Claim 4 (i.e. radial rake not smaller than +3 degrees and not larger than +20 degrees).

However, Flynn, Kuberski and Deller fail to teach plurality of end cutting edges having axial rake angle that is not smaller than -2 degrees and not larger than +10 degrees.

Hougen teaches cutting tool (10) having an inner radial (end) cutting edge (40) that has axial rake angle of approximately 0 degrees to 15 degrees (see figure 1 and Col. 6, lines 48-50). This range meets the limitation axial rake angle limitation claimed in Claim 4.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify Flynn's invention, such that plurality of end cutting edges [first (20) and second (22)] have an axial rake angle of 0-15 degrees as taught by Hougen for the purpose of using tool for cutting soft metal such as aluminum ('573, Col. 6, lines 55-57).

***Allowable Subject Matter***

Claim 7 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

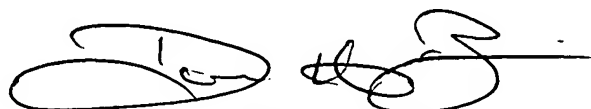
***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sara Addisu at (571) 272-6082. The examiner can normally be reached on 8:30 am - 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Derris Banks can be reached on (571) 272-4419. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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